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### Title

MECHANISMS OF FEBRILE SEIZURE GENESIS IN RODENT MODELS

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**Monday, December 7, 2009**  
**Investigators' Workshop Afternoon Session**  
**3:15 p.m.-4:45 p.m.**

**IW.15**

**MECHANISMS OF FEBRILE SEIZURE GENESIS IN  
RODENT MODELS**

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**Summary:** Febrile Seizures (FS) are a common yet mostly benign form of childhood seizure. Because some forms of FS are associated with serious forms of epilepsy, such as temporal lobe epilepsy, understanding how FS are generated is important for potential prevention, and for mitigation of their pro-epileptogenic effects. By definition, FS involve elevated body temperature, typically as a result of pyrogen exposure. In this context heat itself may interact either directly with neuronal proteins and lipids to enhance excitability or, indirectly, by causing a physiological response, such as hyperventilation, that can trigger an excitatory response. Bacterial and viral pyrogens cause the release of a range of substances that have demonstrated effects on neuronal excitability. An additional, yet crucial, question is whether susceptibility to FS is caused by genetic variation that alters temperature sensitivity of key proteins and network behaviour.

The primary purpose of this workshop is to present state of the art regarding potential mechanisms for the genesis of FS. Dr Oakley will argue that genetic mutations in SCN1A increase thermal susceptibility in FS, Dr Schuchmann will present evidence that respiratory alkalosis drives neuronal excitability changes in FS, and finally, Prof Baram will discuss ideas and data on the involvement of interleukins and direct effects of temperature (e.g. TRP channels) which might cooperate to generate FS. Together, these three presentations will provide an overview of the potential multifactorial nature of FS genesis in patients.

The secondary purpose is more practical and is to expose investigators to three different models of generating hyperthermia in rodent models; warmed air, heated chambers, and closed loop IR heating, each with unique heating profiles, advantages and disadvantages.